

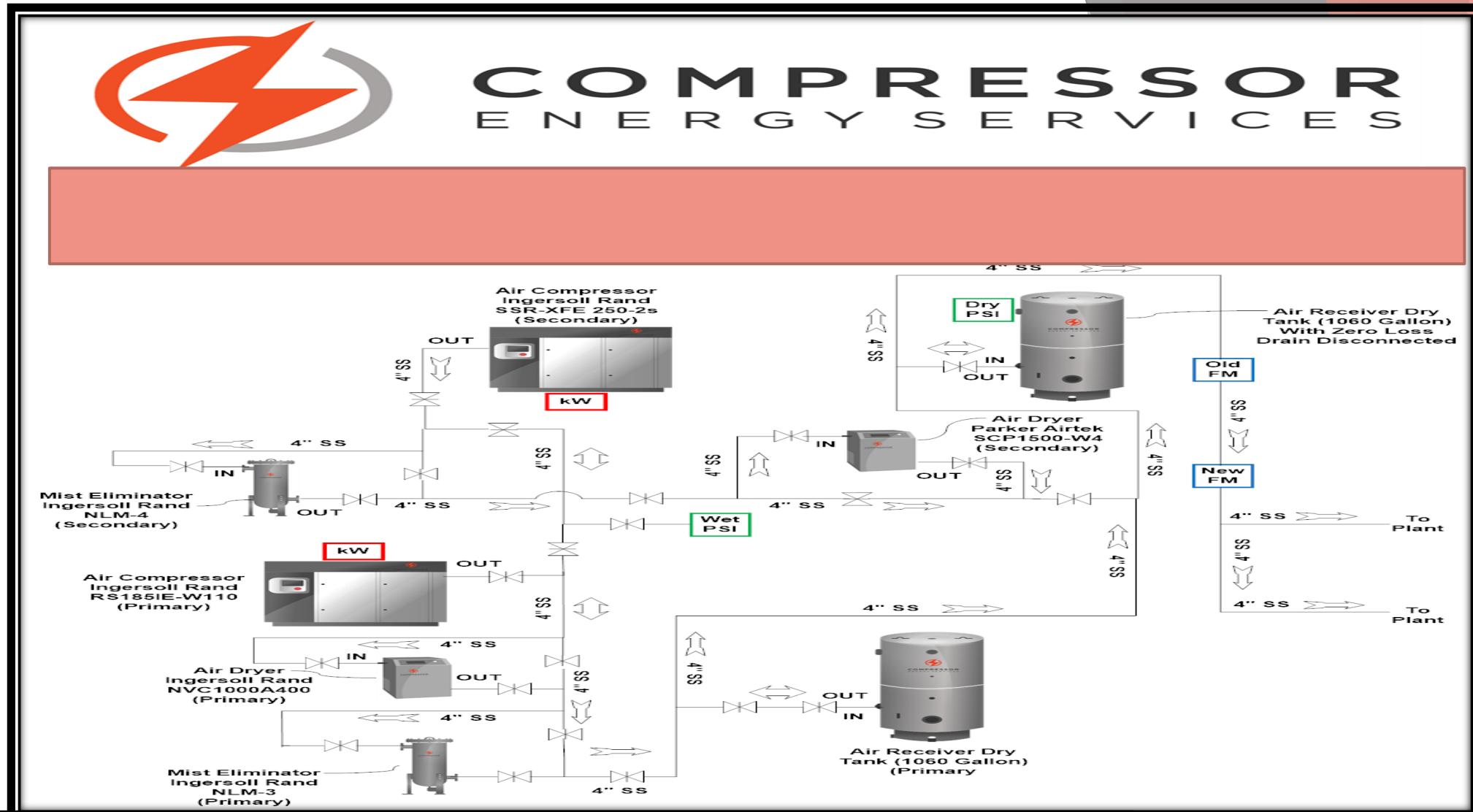
Compressed Air System Assessment: Preliminary Findings Synopsis

By: Compressor Energy Services

For: March 2022



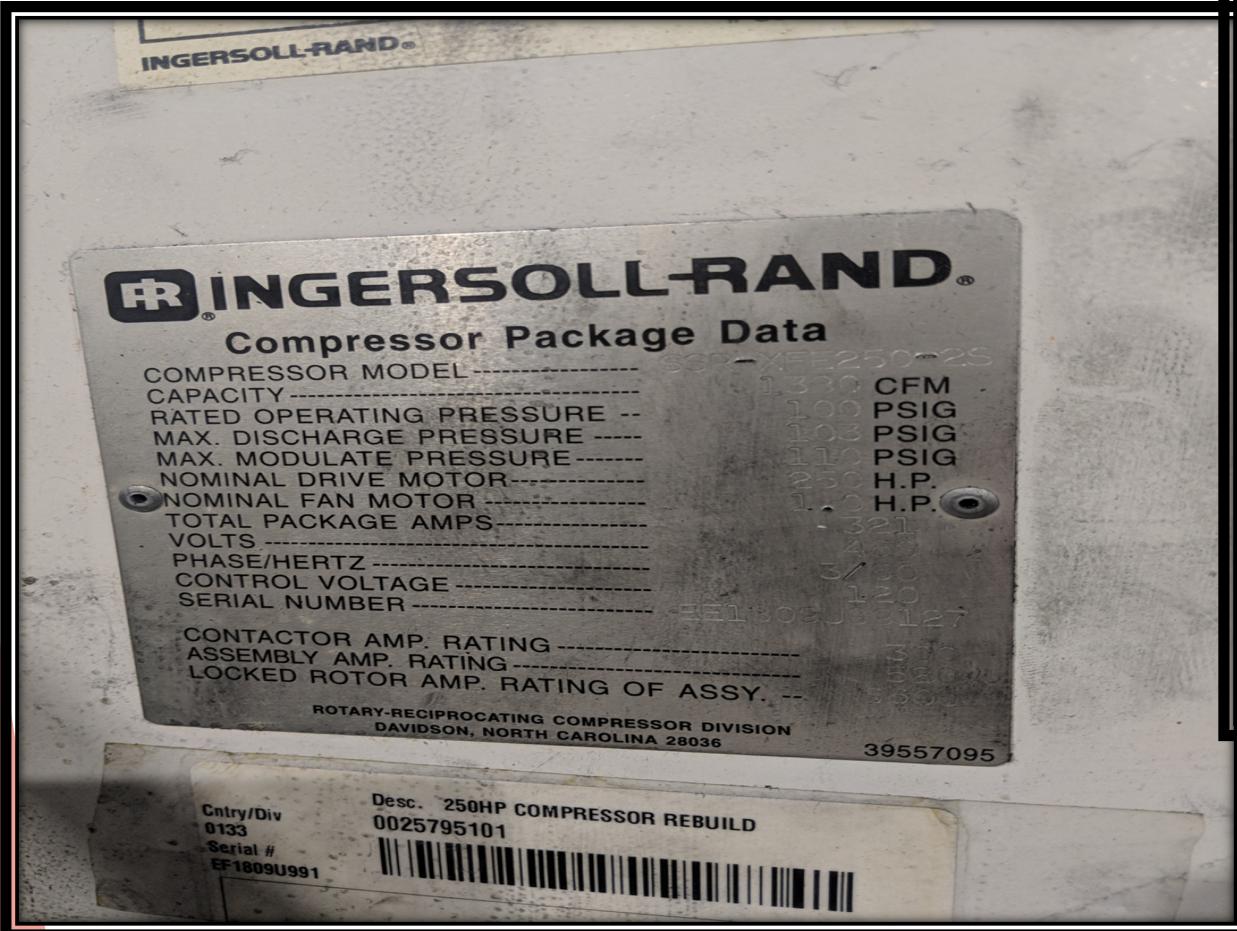
Existing Equipment



| # | Status | HP | Manufacturer | Model | Control Type | Lubricated | Stages | Cooling Method | Type | Pressure Rating | Year | Compress or Hour Meter (Running) | Set-point(s) PSIG | Deploy Meter | Package Input kW | CFM Capacity | Measured Avg kW |
|---|--------|-----|----------------|---------------|--------------|-------------|-----------|----------------|--------------|-----------------|------|----------------------------------|-------------------|--------------|------------------|--------------|-----------------|
| 1 | Lead | 250 | Ingersoll Rand | RS185IE-A110 | Load/No Load | Oil Flooded | Two-Stage | Air Cooled | Rotary Screw | 110 | | 107 | Yes | 223 | 1444 | 216.22 | |
| 2 | Backup | 275 | Ingersoll Rand | SSE XFE250-2S | Load/No Load | Oil Flooded | Two-Stage | Air Cooled | Rotary Screw | 110 | | Yes | 217 | 1380 | 0.76 | | |

CAGI Sheet (SSR-XFE250-2S)

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| Ingersoll-Rand SSR | 2 Stage | 2 Stage | 2 Stage | 2 Stage | 2 Stage | 2 Stage | 2 Stage | 2 Stage | 2 Stage |
|--------------------------------------|-------------|------------------|-----------|-----------|-----------|------------------|-----------|-----------|-----------|
| | XFE200 | EPE200 | HPE200 | XFE250 | EPE250 | HPE250 | XFE300 | EPE300 | HPE300 |
| General Data | | | | | | | | | |
| Capacity FAD | CFM | 1,100 | 990 | 924 | 1,380 | 1,249 | 1,167 | 1,685 | 1,476 |
| Compressor Power | HP | 220 | 220 | 220 | 275 | 275 | 275 | 330 | 330 |
| Nominal Operating Pressure | PSIG | 100 | 125 | 140 | 100 | 125 | 140 | 100 | 125 |
| Maximum Operating Pressure | PSIG | 110 | 135 | 150 | 110 | 135 | 150 | 110 | 135 |
| Minimum Operating Pressure | PSIG | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| Rotor Diameter | mm | 226/182 | 226/182 | 226/182 | 297/250 | 297/250 | 297/250 | 297/250 | 297/250 |
| Male Rotor Speed 1st Stage | RPM | 2864 | 2638 | 2533 | 1525 | 1380 | 1290 | 1860 | 1630 |
| Male Rotor Speed 2nd Stage | RPM | 2724 | 2515 | 2418 | 1322 | 1203 | 1128 | 1593 | 1406 |
| Cooling Data | | | | | | | | | |
| 115 F Maximum Ambient | | | | | | | | | |
| Operating Temperature | F | 215 | 213 | 211 | 207 | 203 | 200 | 209 | 205 |
| Airend Injection Temperature | F | 181 | 181 | 181 | 160 | 160 | 160 | 160 | 160 |
| Heat Removal - Oil Cooler | 1000 BTU/Hr | 476 | 476 | 476 | 595 | 595 | 595 | 714 | 714 |
| Heat Removal - Aftercooler | 1000 BTU/Hr | 131 | 125 | 116 | 175 | 150 | 135 | 217 | 182 |
| Oil Flow | GPM | 57 | 61 | 65 | 68 | 79 | 83 | 68 | 79 |
| Aftercooler CTD | F | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| Fan Air Flow | CFM | 15,000 | 15,000 | 15,000 | 24,000 | 24,000 | 24,000 | 24,000 | 24,000 |
| Maximum Added Static | " W.C. | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 |
| Coolant Sump Capacity | Gallons | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| Total System Lubrication Capacity | Gallons | 30 | 30 | 30 | 33 | 33 | 33 | 33 | 33 |
| Sound Level | dBA | 80 | 80 | 80 | 80 | 80 | 80 | 80 | 80 |
| Electric Data @ 460V-3P-60 Hz | | | | | | | | | |
| Full Load BHP - Package | BHP | 228.25 | 228.25 | 228.25 | 291.5 | 291.5 | 291.5 | 346.5 | 346.5 |
| Full Load BHP - Driver | BHP | 220 | 220 | 220 | 275 | 275 | 275 | 330 | 330 |
| Full Load BHP - Fan | BHP | 8.25 | 8.25 | 8.25 | 16.5 | 16.5 | 16.5 | 16.5 | 16.5 |
| Full Load Amps - Package | Amps | 269.5 | 269.5 | 269.5 | 334.6 | 334.6 | 334.6 | 405.6 | 405.6 |
| Drive Motor RPM | RPM | 1773 | 1773 | 1773 | 1765 | 1765 | 1765 | 1780 | 1780 |
| Drive Motor Frame ODP | NEMA | 445T | 445T | 445T | 445T | 445T | 445T | 447T | 447T |
| Driver Eff/Power Factor/% of Load | 100% | 93.1/87.5 | 93.1/87.5 | 93.1/87.5 | 93.5/88.3 | 93.5/88.3 | 93.5/88.3 | 94.4/85.2 | 94.4/85.2 |
| | 75% | 93.3/85.6 | 93.3/85.6 | 93.3/85.6 | 93.5/86.3 | 93.5/86.3 | 93.5/86.3 | 94.5/83.9 | 94.5/83.9 |
| | 50% | 92.5/79.5 | 92.5/79.5 | 92.5/79.5 | 93.3/81.5 | 93.3/81.5 | 93.3/81.5 | 93.6/77.9 | 93.6/77.9 |
| Dimensions & Weights | | | | | | | | | |
| Length / Width / Height | Inches | 126" x 63" x 75" | | | | 148" x 76" x 85" | | | |
| Weight | Pounds | 7,020# | 7,020# | 7,020# | 13,080# | 13,080# | 13,080# | 13,080# | 13,080# |
| Discharge Air Connection | Inches | 2-1/2" NPT | | | | 3" NPT | | | |
| Condensate Line Connection | Inches | 1/2" NPT | | | | | | | |

CAGI Sheet (RS185ie-A110)

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Ingersoll Rand COMPRESSOR DATA SHEET

Federal Uniform Test Method for Certain Air Compressors Not Applicable

Rotary Compressor: Fixed Speed

MODEL DATA - FOR COMPRESSED AIR

| 1 | Manufacturer: Ingersoll Rand | | |
|-----|---|---------------------------------------|-----------------|
| 2 | Model Number: RS185ie-A110 | | Date: 4/13/2020 |
| | <input checked="" type="checkbox"/> Air-cooled | <input type="checkbox"/> Water-cooled | Type: Screw |
| | <input checked="" type="checkbox"/> Oil-injected | <input type="checkbox"/> Oil-free | # of Stages: 2 |
| 3* | Rated Capacity at Full Load Operating Pressure ^{a,c} | 1444 acfm ^{a,c} | |
| 4 | Full Load Operating Pressure ^b | 100 psig ^b | |
| 5 | Maximum Full Flow Operating Pressure ^c | 110 psig ^c | |
| 6 | Drive Motor Nominal Rating | 250 hp | |
| 7 | Drive Motor Nominal Efficiency | 96.2 percent | |
| 8 | Fan Motor Nominal Rating (if applicable) | 5.4 hp | |
| 9 | Fan Motor Nominal Efficiency | 89.5 percent | |
| 10* | Total Package Input Power at Zero Flow ^a | 76.2 kW ^a | |
| 11 | Total Package Input Power at Rated Capacity and Full Load Operating Pressure ^d | 223.4 kW ^d | |
| 12* | Package Specific Power at Rated Capacity and Full Load Operating Pressure ^e | 15.47 kW/100 cfm ^e | |

* For models that are tested in the CAGI Performance Verification Program, these are the items verified by the third party program administrator. Consult CAGI website for a list of participants in the third party verification program: www.cagi.org

NOTES:

- a. Measured at the discharge terminal point of the compressor package in accordance with ISO 1217. Annex C: ACFM is actual cubic feet per minute at inlet conditions.
- b. The operating pressure at which the Capacity (item 3) and Electrical Consumption (item 11) were measured for this data sheet.
- c. Maximum pressure attainable at full flow, usually the unload pressure setting for load/no load control or the maximum pressure attainable before capacity control begins. May require additional power.
- d. Total package input power at other than reported operating points will vary with control strategy.
- e. Tolerance is specified in ISO 1217, Annex C, as shown in table below.

NOTE: The terms "power" and "energy" are synonymous for purposes of this document.

| Volume Flow Rate at specified conditions | | Volume Flow Rate | Specific Energy Consumption | No Load / Zero Flow Power |
|--|----------------------|------------------|-----------------------------|---------------------------|
| m ³ /min | ft ³ /min | % | % | % |
| Below 0.5 | Below 17.6 | +/- 7 | +/- 8 | |
| 0.5 to 1.5 | 17.6 to 53 | +/- 6 | +/- 7 | |
| 1.5 to 15 | 53 to 529.7 | +/- 5 | +/- 6 | +/- 10% |
| Above 15 | Above 529.7 | +/- 4 | +/- 5 | |

ROT 030.2 12/19 Rev 5 This form was developed by the Compressed Air & Gas Institute for the use of its members participating in the PVP. CAGI has not independently verified the reported data.



Member



COMPRESSOR ENERGY SERVICES
CELEBRATING 20 YEARS

Dashboard



New ES Dash Board

| | |
|--|---------------|
| # of Compressors in System | 3 |
| Combined System Capacity at Full Load (SCFM) | 2824 |
| Average Measured Flow (SCFM) ¹ | 1155 |
| Non-Productive Measured Flow (SCFM) ² | 830 |
| Cost of Non-Productive Demand (\$/Year) ³ | \$ 204,868.91 |
| Combined System Power at Full Load (kW) | 440.0 |
| Average Measured Power (kW) ⁴ | 217.0 |
| Total kWh Consumption (kWh Annually) ⁵ | 1,900,770 |

Annual Cost/CFM (\$/Year)



Annual Hours of Operation (Hrs./Year)



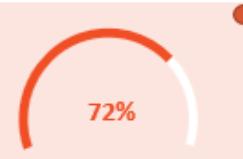
Average System Pressure (PSIG)



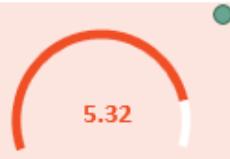
% of Compressor Theoretical Efficiency



% Non-Productive Flow Demand



System Efficiency (CFM/kW)



¹ See Power, Flow & Pressure Graph on Data Summary Page

See CAir System Information Page

830 X 246.83001710736

See Power, Flow & Pressure Graph on Data Summary Page

216.98289818603 X 8760

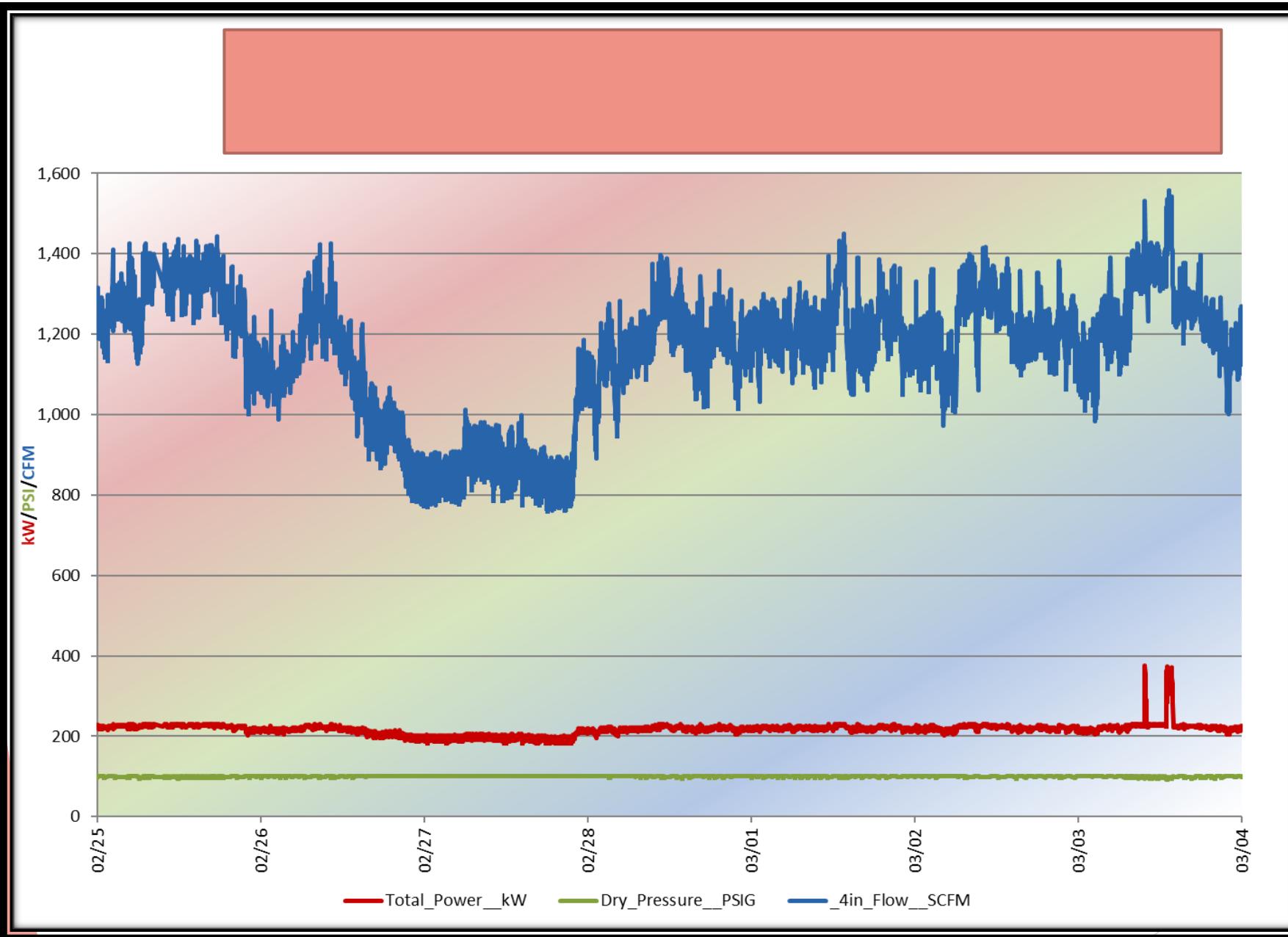
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COMPRESSOR
ENERGY SERVICES

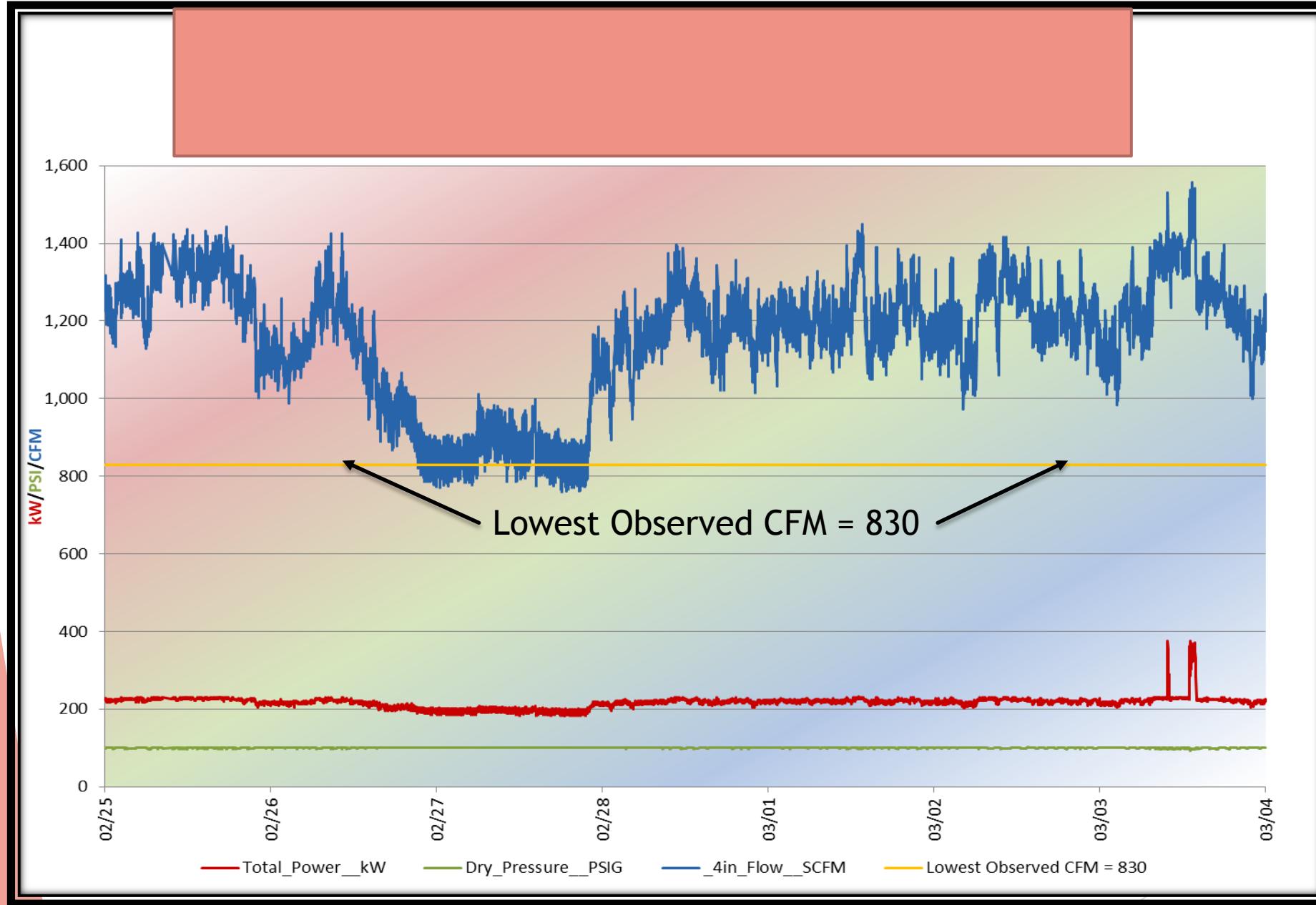
CELEBRATING 20 YEARS

Power, Flow and Pressure

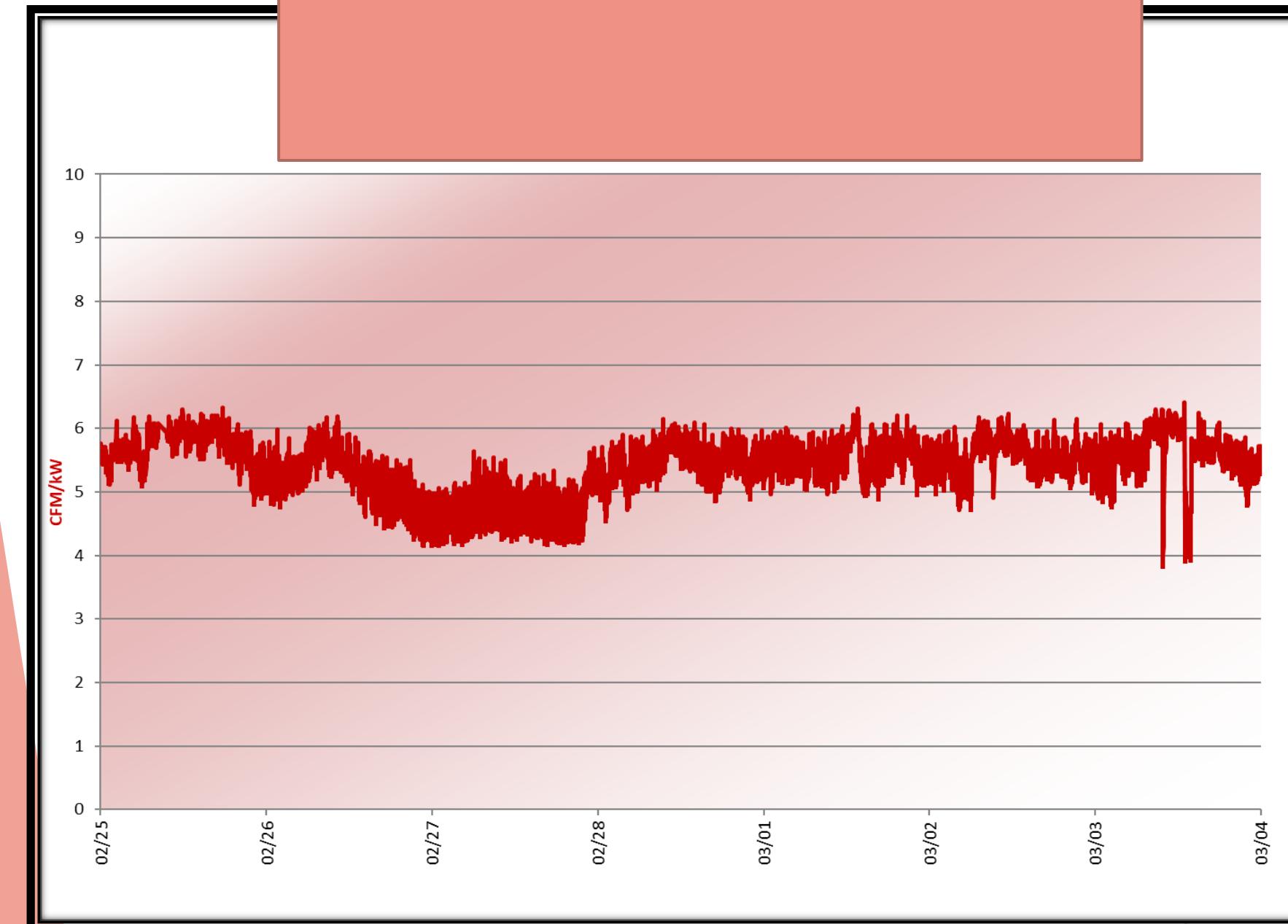


Average Power: 217kW
Average Flow: 1155 CFM
Average Pressure: 100 PSI

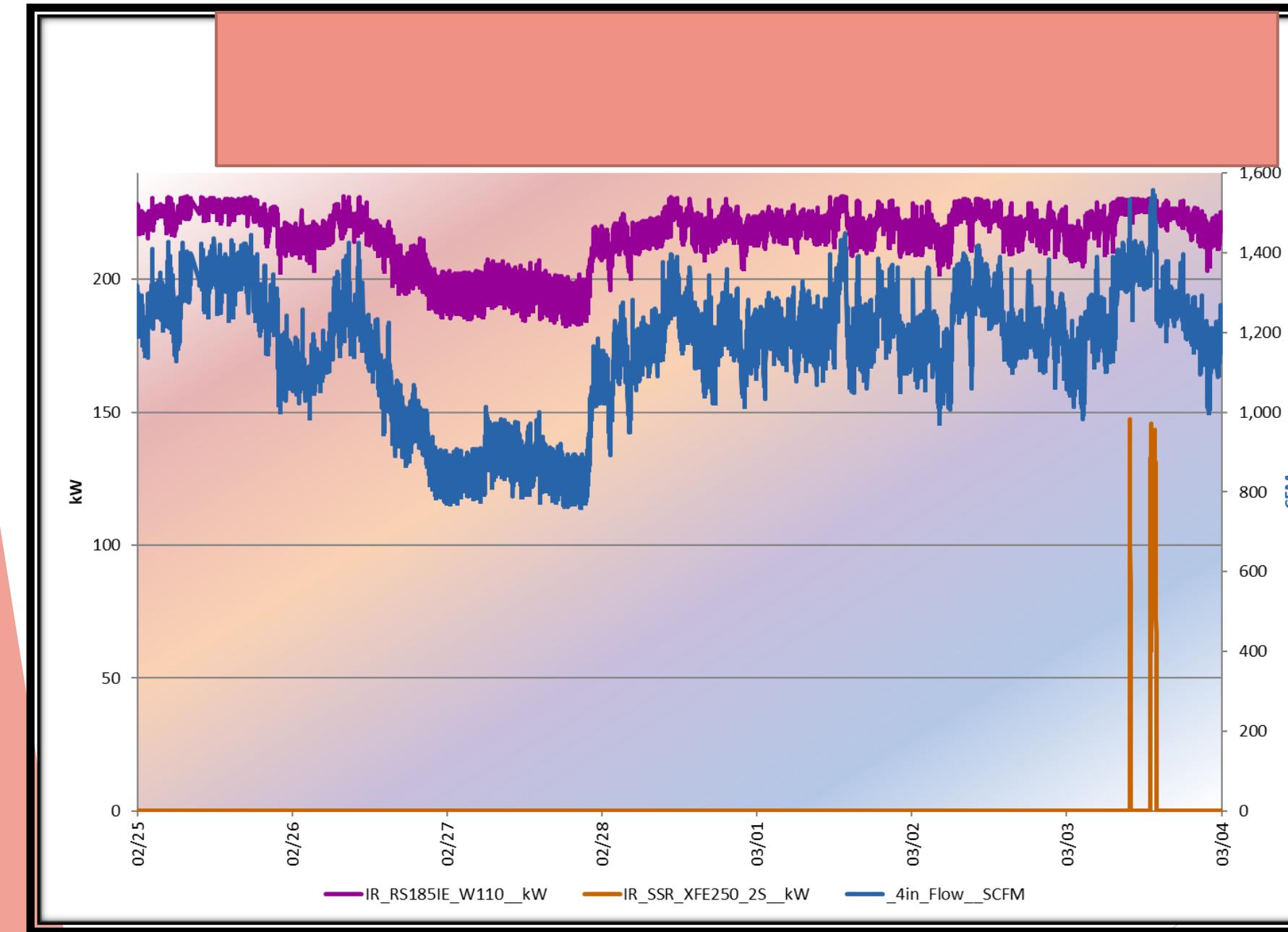
Lowest Observed Flow



Power and Flow Ratio



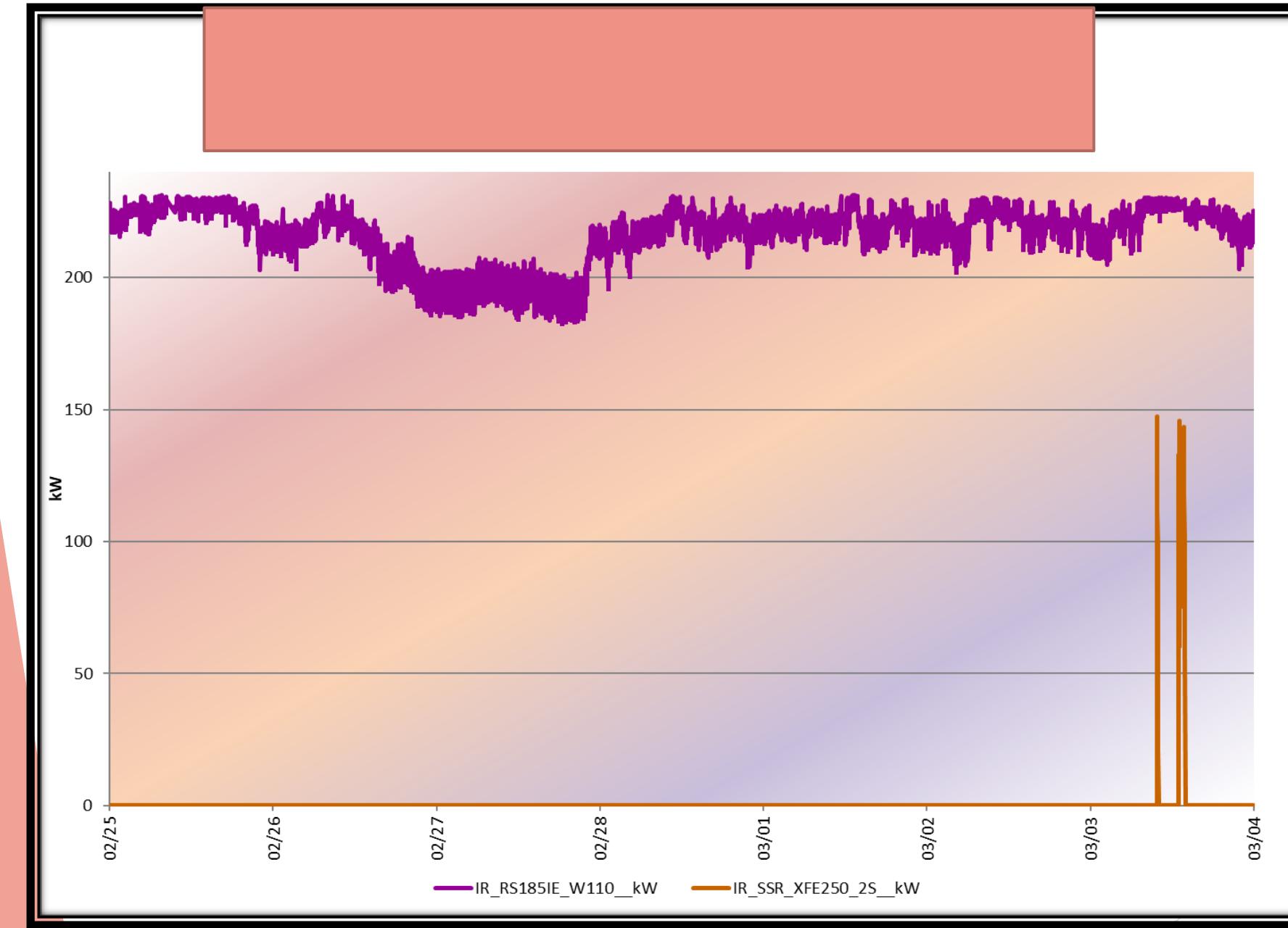
Power from Compressor and Flow



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Power from Compressor



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